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The time, therefore, seems to be ripe for a combination of forces, so that workers in these important lines may become known to one another, and the enthusiasm of students excited and sustained.

Led by these considerations we venture to suggest the organization of what we provisionally call 'the International Association for promoting the Study of Quaternions and allied systems of Mathematics.' By such an organization vector analysis would receive a great impetus. A journal published from time to time would keep the members of the Association in touch with the various aspects of the subject, both pure and applied, and would facilitate interchange of opinions on the introduction and adoption of new notations.

In these few lines we have tried to point out the important task of the Association, but shall be obliged for any suggestion or improvement. It is almost needless to say that we are only preparing the way; and once the Association has been started we shall be ready to place it in the hands of persons much more competent than ourselves to further its best interests.

We earnestly hope that all friends will appreciate our endeavors and show us at once some token of approval.

We remain, Dear Sirs,

Very respectfully yours,

P. MOLENBROEK, the Hague, Holland.

S. KIMURA, Yale University, U. S. A.

October, 1895.

N.B.—We would ask those who are in Europe to communicate with the first of the above names, and those in America with the second.

SCIENTIFIC LITERATURE.

Proceedings of the International Electrical Congress, Chicago, 1893. American Institute of Electrical Engineers. Edited by Max Osterberg.

The publication of this volume of nearly 500 pages insures a permanent record of the Chicago Electrical Congress and gives evidence of the value and importance of its work. The Congress was unique in its composition, since it consisted of both an official and an unofficial body. The 'Chamber of Delegates' was a small body rep-

resenting ten governments and composed only of those presenting duly authenticated official credentials.

It may be said in this connection that while the expenses of the official representatives of foreign governments were paid, as far as known to the writer, our own government went only so far as to appoint representatives through its Secretary of State, but neither paid expenses nor, what is of much more importance, provided in any way for the meeting of this body of officially delegated scientific men from abroad, and took no official notice of them. This neglect was a source of great chagrin to the representatives of the United States. It would be impossible in Europe, with the sentiment prevailing there respecting the official etiquette befitting such an occasion.

The papers printed in this volume constitute a valuable collection of great variety, and no one interested in the higher phases of electrical theory and practice can afford to be without them. It is gratifying to know that the sales of the 'Proceedings' have already nearly or quite met the cost of publication, while a goodly number of volumes remain in the possession of the Institute.

An omission of some importance, in view of subsequent controversies, occurs in the report of the 'Proceedings of the Chamber of Delegates.' I refer to the appointment of the committee on notation and nomenclature. The presentation of the committee's report is noted, but one looks in vain for the names of the gentlemen composing it.

Inasmuch as a committee was appointed to draw up specifications for the Clark cell, consisting of Messrs. Helmholtz, Ayrton and Carhart, it may not be amiss to explain here why this committee never reported.* The chairman, Professor von Helmholtz, it will be remembered, was seriously injured on his return trip to Europe, and this unfortunate accident delayed action. The writer, however, received finally a long official communication from him in relation to the Clark cell and the legalization of the units adopted by the Congress. The proposals of von Helmholtz were accepted by myself with some slight modifications. Some correspond-

* *Proceedings*, p. 20.

ence was also had with Professor Ayrton, which served to clear up points of uncertainty. The committee of the British Board of Trade, however, preferred to adhere to the test-tube form of cell and proceeded to secure the legalization of their own specification without reference to the finding of the international committee. The work had all been done by the committee before the death of von Helmholtz, except the drawing up of a formal report. Upon the appointment of the committee of the National Academy of Sciences, all the information in the hands of the writer and the conclusions reached by the majority of the international committee were communicated to the chairman of the new committee, and they are embodied in his report (see *Mis. Doc. No. 115*, 53d Congress, Senate). I take pleasure in adding that the specification relating to the Clark cell, which was reported to Congress by the Academy committee, meets my entire approval and has some points of superiority over that legalized by the English 'Order in Council.' It is not likely, however, that any discrepancies between the E. M. F.'s of the two will be found to exist.

It seems necessary to add that the volume now under review is somewhat seriously marred by many typographical and other errors. The proof should certainly have been read by more than one person and by some one familiar with the details of the Congress.

HENRY S. CARHART.

The Alps from End to End. BY SIR WILLIAM MARTIN CONWAY. Westminster, Constable. New York, Macmillan & Co. 1895.

Sir William M. Conway, who has gained distinction among explorers of high mountains by his expedition to the Himalayas, made a rapid scramble over the Alps from end to end in the summer of 1894, and now presents a simple narrative of his excursion in a rather large book of four hundred pages with a hundred full-page plates; the latter being notable for the high average elevation of the points of view. Having taken Swiss guides to aid him in the Himalayas, Conway now brings two Gurkhas—natives of Nepal—to go with him over the Alps, at the same time advancing their mountaineering education, and thus enabling them better to

assist in Himalayan exploration on their return to the East. The use of a compass, an aneroid and a good contour map to find the way in the clouds is ingenious and worth learning. There is extremely little physiographical or geological matter in the book, but it abounds with the minutiae of personal incidents. For example, opening the book at random, we read: "On calling for provisions we found that the men had devoured all the fresh meat at breakfast, and that the day was to be a bread-and-butter one. Fitzgerald and I purloined the end of a sausage in revenge. It was easily secreted, but the straits to which we were put to eat it secretly," etc., etc. Of a day opening with rain it is frankly recorded: "We were delighted to hear that the morning was one for bed rather than mountains;" the glory of trips at headlong speed being apparently in having done them rather than in the doing. The book records a redoubtable athletic experience, but almost any one might write a volume if such shadowy substance is worthy of permanent record in large pages with open type. The only chapter of scientific value is on Mountain Falls; this being based chiefly on the account by Buss and Heim of the landslide of Elm, Canton Glarus, in 1881. W. M. D.

A Handbook for Surveyors. By MANSFIELD MERRIMAN and JOHN P. BROOKS, of Lehigh University. New York, J. Wiley & Sons, 1895. 16 mo., pp. 242.

This little book is at once text-book and field reference book for students and for surveyors in the field. It contains, in compact and systematic form, the information, the principles and the methods of surveying, so far as required in advance of the subject of railroad location—those of land and town surveying, leveling, triangulation and topography. It is given the pocket-book form in order that it may be conveniently used in the field, where its tables are likely to be at any moment useful, and where reference to the text-book is sometimes found advisable by the old practitioner as well as by the student and novice. Special attention is given to the testing of instruments and their comparison, and standard methods with some excellent new processes are described with the